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Hitachi Freedom Storage™
Thunder 9500™ V Series

SANtinel 9500V
User's Guide

Trademarks

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Document Revision Level

Revision	Date	Description
MK-92DF613-P	September 2002	Preliminary Release
MK-92DF613-0	November 2002	Revision 0, supersedes and replaces MK-92DF613-P
MK-92DF613-1	January 2003	Revision 1, supersedes and replaces MK-92DF613-0

Source Documents Used in this Revision

The following source documents were used to produce this guide:

- LUN Security 9470 User's Guide, (LUNSecurity_0E, dated 8/01/02).
- LUN Security User's Guide (DF600), (LUNSecurity_0E, dated 8/01/02).

Changes in this Revision

- Deleted a statement (and associated figure) in Chapter 3, step 7 referring to rebooting the array unit. The array unit does not have to reboot.

Referenced Documents

- *9500V User and Reference Manual* (MK-92DF601)
- *Resource Manager 9500V User's Guide for GUI* (MK-92DF605)
- *Resource Manager 9500V User's Guide for CLI* (MK-92DF603)

Preface

This user's guide provides instructions for installing and using SANtinel 9500V. You should read the operating procedures and notices included in this guide before using SANtinel 9500V.

The *SANtinel 9500V User's Guide* assumes that:

- The user has a background in data processing and understands direct-access storage device subsystems and their basic functions.
- The user is familiar with the Hitachi Disk array subsystem.
- The user is familiar with the *Resource Manager 9500V (for GUI) User's Guide and/or the Resource Manager 9500V (for CLI) User's Guide*.
- The user is familiar with the Windows® operating system.

Note: When you replace the Host Bus Adapter (HBA) of the host (server) with the system using SANtinel 9500V, you need to change the setting of SANtinel 9500V (see section 4.6 - Changing the WWN of the Host HBA).

For additional information on the 9500V subsystem features and functions, please contact your Hitachi Data Systems account team, or visit Hitachi Data Systems online at http://www.hds.com.

Note: The use of Hitachi Resource Manager, the SANtinel software, and all other Hitachi Data Systems products is governed by the terms of your license agreement(s) with Hitachi Data Systems.

Note: The screens shown in this document were captured on a Windows® system with the Internet Explorer web browser. The screens may display differently on other operating systems and browsers. Please refer to the *Resource Manager 9500 User's Guide for GUI* (MK-92DF605) for further information on other operating systems and browsers.

Note: The term "9500V" refers to the entire Hitachi Freedom Storage™ Thunder 9500™ V Series subsystem family, unless otherwise noted.

Note: The term "DF600" refers to the 9500V subsystem, unless otherwise noted.

Note: The term "LUN Security " refers to SANtinel, unless otherwise noted.

COMMENTS

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Please refer to specific page(s) and paragraph(s) whenever possible.

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Thank you!

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Chapter 1 Overview of SANtinel 9500V

1.1 Functional Overview

The SANtinel 9500V feature enables specific hosts to access arbitrary Logical Unit Numbers (LUNs). This feature prevents data from damage caused by illegal access in a storage-area network (SAN) environment. By using a host's World Wide Name (WWN), you can set a Logical Unit Number (LUN) to communicate only with specific WWN(s); this allows you to limit access to that LUN from specific host(s). When WWNs are specified, the hosts assume that only permitted LUNs are connected to these hosts. Figure 1.1 presents a functional overview of the SANtinel 9500V.

The major functions of the SANtinel 9500V are:

- The SANtinel 9500V enables the user to specify or change LUN accessibility for each selected host from Resource Manager 9500V.
- Once specified, the SANtinel 9500V allows the host to recognize only the specified Logical Units (LUs).

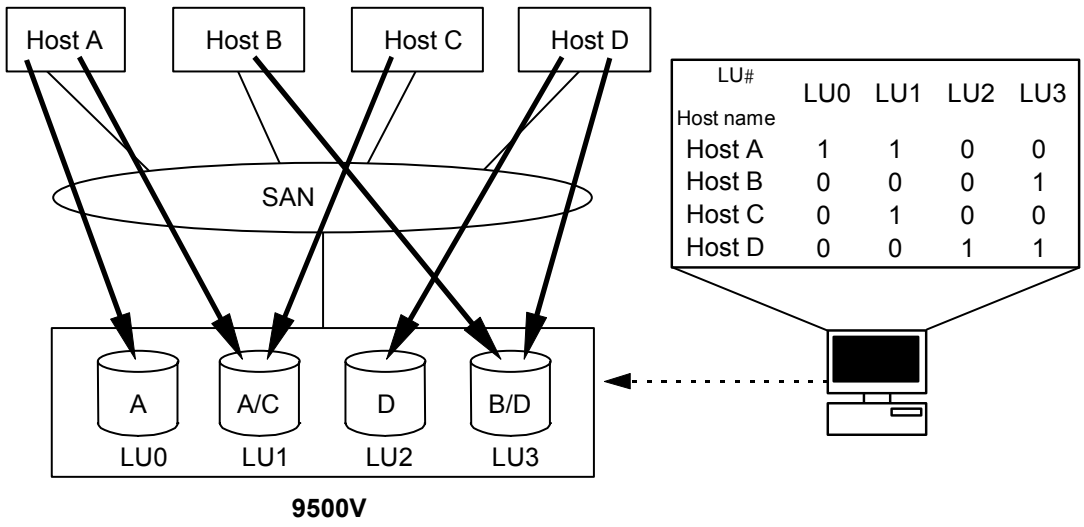


Figure 1.1 SANtinel 9500V Functional Overview

1.2 Specifications

The specifications of SANtinel 9500V are listed in Table 1.1:

Table 1.1 SANtinel 9500V Specifications

Item	Specifications
Available LUNs	Units can be specified if they already have the SANtinel 9500V as a licensed feature.
Number of WWNs to be Registered	Up to 128 WWNs of hosts for a port can be registered.
Security Setting	Specify one or more WWNs that can access LUNs. • You can specify 2 or more WWNs for each LUN. • If a LUN mapping function is used, security can be set up for every port. Furthermore, LUN Security (SANtinel) can also set up security for every WWN in the same port.
WWN Change	You can change the WWN access without disrupting the security settings. • The WWN change function is effective when you have to change the WWN; for example, when you replace a HBA of an specific host.
SANtinel 9500V Enable/Disable	SANtinel 9500V can be enabled or disabled for each port. You can also disable SANtinel 9500V temporarily. • The security information that has been set is retained while LUN Security is disabled. It can be restored when SANtinel 9500V is enabled again. • Since SANtinel 9500V is disabled when it is initially installed, the system can easily be operated.
Security level of the SANtinel Control Feature	When using the SANtinel Control Feature, you can select either “Check INQUIRY” or “Check All Commands” as a security level. • The “Check INQUIRY” option specifies checking the access made to LUs with an INQUIRY command (one of the SCSI commands). • The “Check All Commands” option specifies checking the access made to LUs with all the SCSI commands individually.
Setting in a hot replacement	Security can be set up from the Resource Manager 9500V without rebooting the array unit.

1.3 Notes on Setting SANtinel 9500V Information

- Verify that the SANtinel 9500V setting information is correct and accurate. The settings must be correct for the system to run smoothly. For details, refer to *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
- This function is not available when a host (OS or driver) cannot identify an LU without LUN#0 or when a host cannot identify LUs after an undefined LU is found (when "Inquiry" is not issued).
- When you replace the HBA of the host (server) attached to a 9500V using SANtinel 9500V, be sure to change the setting of the SANtinel 9500V. For details, see section 4.6 Changing the WWN of the Host HBA.
- When changing the security level on a SANtinel 9500V feature from "Check INQUIRY" to "Check All Commands," and vice versa, stop I/O operations from a host that is already registered in the WWN permitted to access the SANtinel information of the port concerned, and then change the setting.
- SANtinel 9500V settings (enabling or disabling) are valid after the host is recognized again. ***Note:*** The settings are not valid immediately after the setting. To make the setting valid, reboot the host (to be recognized again).

Chapter 2 Installing and Uninstalling SANtinel 9500V (GUI)

This section includes the following:

- Installing SANtinel 9500V
- Uninstalling SANtinel 9500V

2.1 Installing SANtinel 9500V

The SANtinel 9500V feature is usually unselectable (locked). To make this feature available, you must install SANtinel 9500V and make its functions selectable (unlocked). To install this function, use the key code provided with the optional feature.

SANtinel 9500V is installed and uninstalled through the Resource Manager 9500V.

Note: Before installing and uninstalling, make sure that the array unit is in normal operating mode (for details, refer to *Resource Manager 9500V User's Guide for GUI* (MK-92DF605). If a failure such as a controller blockade has occurred, installation and uninstallation operations cannot be performed.

To install SANtinel 9500V using the GUI version of Resource Manager 9500V:

1. Start Resource Manager 9500V and change to **Management Mode**. For details, refer to the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
2. Register the array unit in which you will install SANtinel 9500V and connect to this array unit. For details, refer to *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).

The Array System Viewer panel appears and displays the connected subsystem (see Figure 2.1)

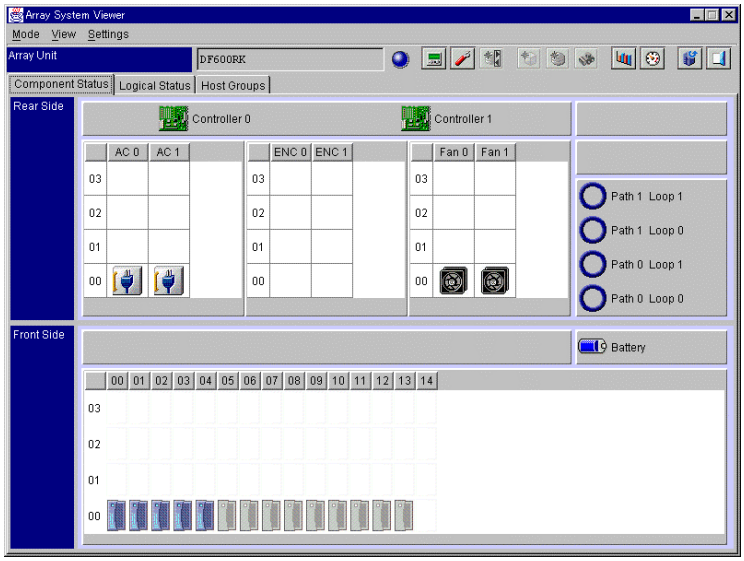


Figure 2.1 Array System Viewer Panel

3. From the **Settings** menu, select **Configuration Settings**. Alternatively, from the tool bar, select the **Configuration Settings** button.

4. From the resulting Parameter panel, click the **Options** tab (see Figure 2.2).

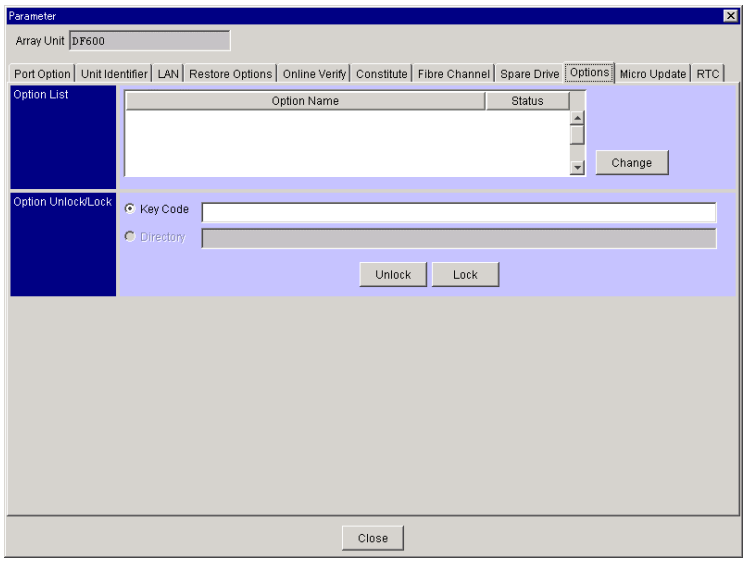


Figure 2.2 Parameter Panel

5. Enter a key code in the text box and click the **Unlock** button.

6. A message appears, requesting a confirmation to unlock the SANtinel 9500V feature. Click the **OK** button (see Figure 2.3).

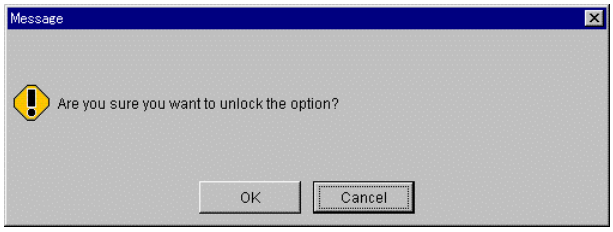


Figure 2.3 The Unlock Confirmation Request Message

7. A message appears, confirming that this optional feature is unlocked. Click the **OK** button (see Figure 2.4).

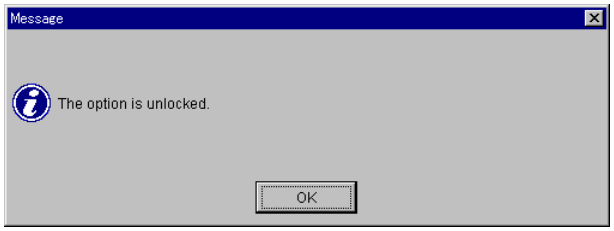


Figure 2.4 The Unlock Confirmation Message

The updated Parameter panel appears (see Figure 2.5).

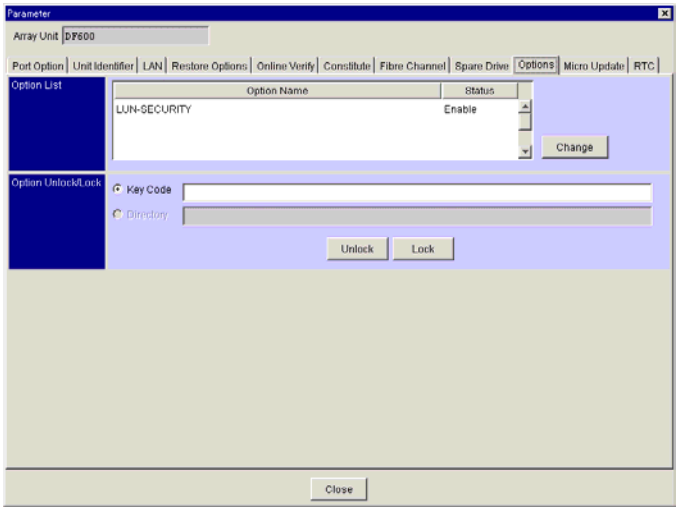


Figure 2.5 Parameter Panel (Options tab: unlocked: Enable)

2.2 Uninstalling SANtinel 9500V

The uninstall process for SANtinel 9500V requires the use of the key code provided with the optional feature.

To uninstall SANtinel 9500V using the GUI version of Resource Manager 9500V:

1. Start Resource Manager 9500V and change to **Management Mode**. For details, refer to the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
2. Register the array unit in which you will uninstall SANtinel 9500V. Connect to this array unit. The Array System Viewer Panel appears (refer to Figure 2.1).
3. From the **Settings** menu, select **Configuration Settings**. Alternatively, from the tool bar, select the **Configuration Settings**  button.
4. From the resulting Parameter panel, click the **Option** tab (refer to Figure 2.2).
5. Lock the optional features by using the following:
   a) Enter a key code in the text box.
   b) Click the **Lock** button.
6. A message appears, requesting a confirmation to lock the SANtinel 9500V feature. Click the **OK** button (see Figure 2.6).

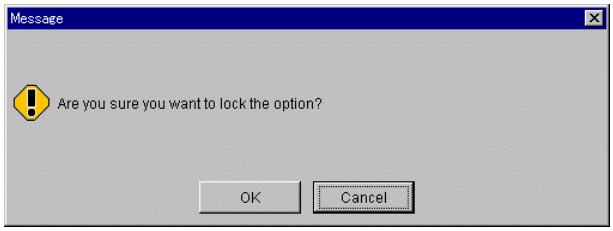


Figure 2.6 Lock Confirmation Request Message

7. A message appears, confirming that this optional feature is locked. Click the **OK** button (see Figure 2.7).

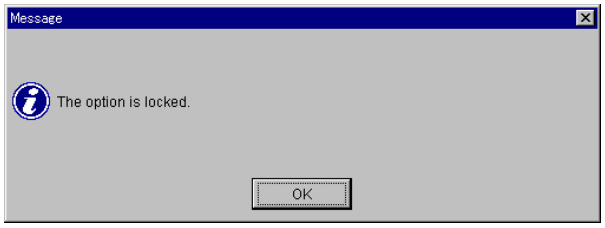


Figure 2.7 Locked Confirmation Message

The updated window appears (refer to Figure 2.2).

Chapter 3 Enabling or Disabling SANtinel 9500V (GUI)

To enable or disable SANtinel 9500V (without uninstalling this function) using the GUI version of Resource Manager 9500V:

1. Start the Resource Manager 9500V and change to **Management Mode**. For details, refer to the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
2. Register the array unit in which you will uninstall SANtinel 9500V. Connect to this array unit (for details, refer to *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).

The Array System Viewer panel appears and displays the connected array unit (see Figure 3.1).

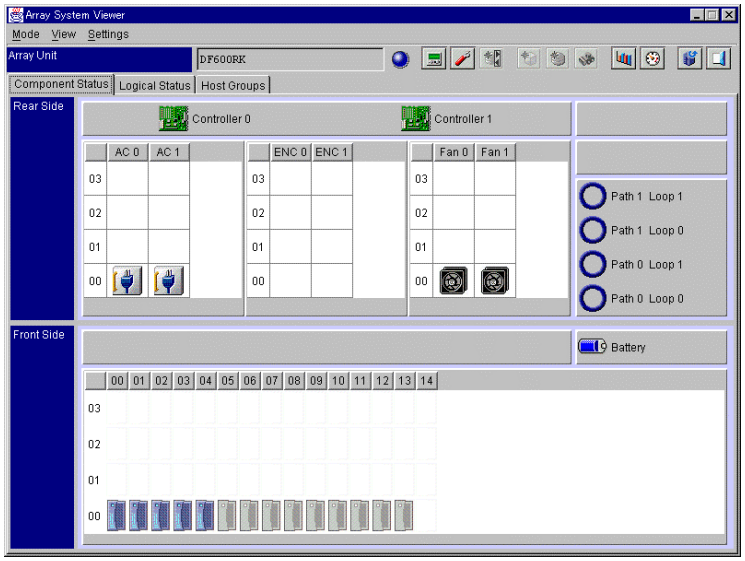


Figure 3.1 Array System Viewer Panel

3. From the **Settings** menu, select **Configuration Settings**. Alternatively, from the tool bar, select the **Configuration Settings** button.
4. From the resulting Parameter panel, click the **Options** tab (see to Figure 3.2).

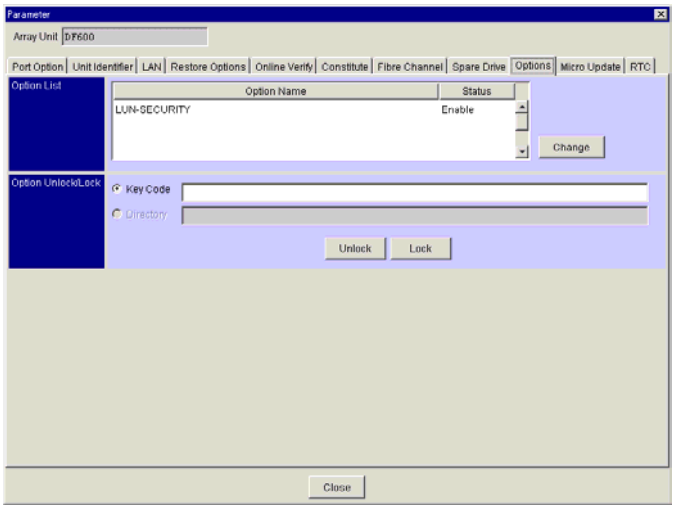


Figure 3.2 Parameter Panel (Options tab: No Option)

5. Click **LUN-SECURITY** in the **Option Name** text box, then click the **Change** button.
6. In the resulting message, click **OK** button (see Figure 3.3).

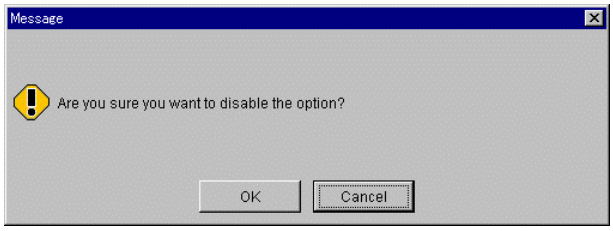


Figure 3.3 Enable/Disable Request Confirmation Message

7. A message appears, confirming that this option is set. Click the **OK** button (see Figure 3.4).

Figure 3.4 Confirmation Message

The updated window appears (see Figure 3.5).

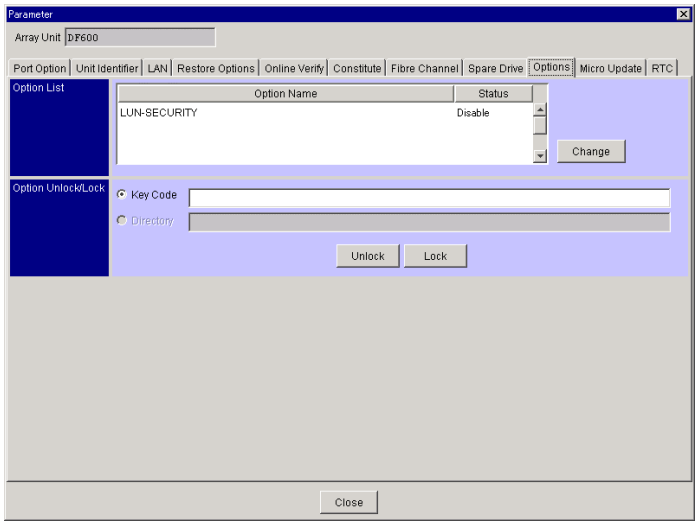


Figure 3.5 Option Verification

Note 1: This setting is not active until the host is rebooted. The subsystem cannot access the host until the reboot is completed and the host restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

Note 2: Even when the SANtinel 9500V feature is disabled, the access check settings are valid.

Note: It may take time for an array unit to respond. Do not manually power off the array unit. However, if it does not respond after 10 minutes or more, check the condition of the array unit.

A message appears stating that the restart has finished (see Figure 3.6). Click the **OK** button. The Array System Viewer panel closes. To perform other operations on the Main screen, select an array unit from the Main screen and open the selected unit.

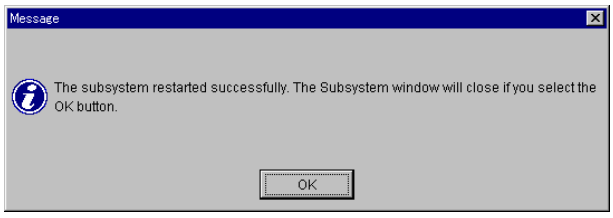


Figure 3.6 Restart Successful Message

Chapter 4 Browsing and Setting SANtinel 9500V Information (GUI)

When SANtinel 9500V information has been set, only specified hosts are allowed to access the selected LUNs. SANtinel 9500V information consists of the following:

- Host Identification Information
- Access Check Required Information
- Setting the Security Information
- Deleting the WWN of the Host HBA
- Deleting the WWN Accessible for Each LUN
- Changing the WWN of the Host HBA (Changing the WWN when the host is replaced)

4.1 Host Identification Information

Host identification specifies which hosts are allowed to access a selected LUN. This information contains three setting items per host for each. Up to 128 hosts can be specified.

1. Node name of host (mandatory)
2. Port name of host (mandatory)
3. LUN which allows the host to access (specified with internal LU, mandatory)

4.2 Access Check Required Information

This information specifies whether a selected LUN inhibits accessibility by hosts other than the specified host. By selecting Security Information Enable, a selected LUN inhibits accessibility by hosts other than the specified host. By not selecting Security Information Enable, a selected LUN can be accessed by all hosts, ignoring the host identification information.

The following list (see Table 4.1) indicates whether each setting item is set, browsed, and access-checked.

Table 4.1 Host Identification Item Status

No.	Host Identification Item	Setting	Browsing	Access-check
1	Host's node name	Enabled	Enabled	Not checked
2	Host's port name	Enabled	Enabled	Checked
3	LUN which allows the host to access	Enabled	Enabled	Checked

Host identification information and Access Check Necessity Information must be set for each port.

4.3 Setting the Security Information

Security information is set through the Resource Manager 9500V.

Note: Before setting the security information, you must install SANtinel 9500V and make its functions selectable (unlocked). For details, refer to Chapter 2 – Installing and Uninstalling SANtinel 9500V (GUI).

1. Start Resource Manager 9500V and change to **Management Mode**. For details, refer to the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
2. Register the array unit in which you will want to set SANtinel 9500V and connect to this array unit. The Array System Viewer panel appears (see Figure 4.1).

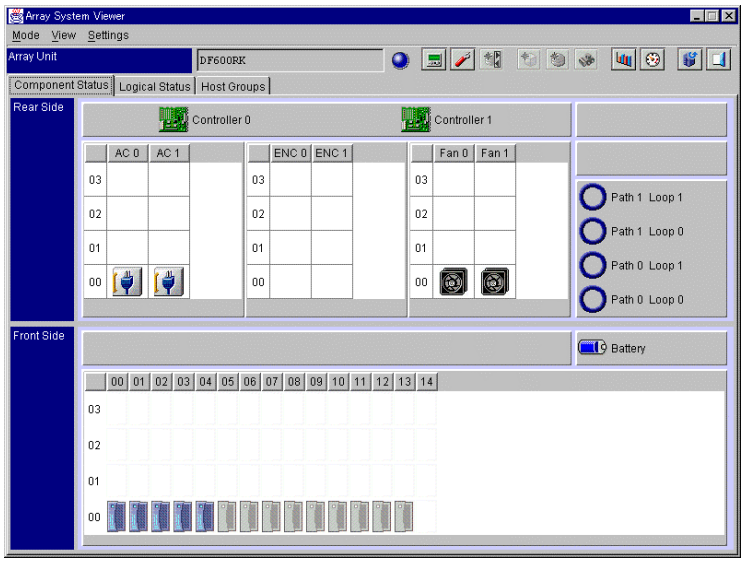


Figure 4.1 Array System Viewer Panel

3. Click the **Host Groups** tab and select the Port for which you want to set the security information.

4. From the **Settings** menu, select **Modify Security** (see Figure 4.2).

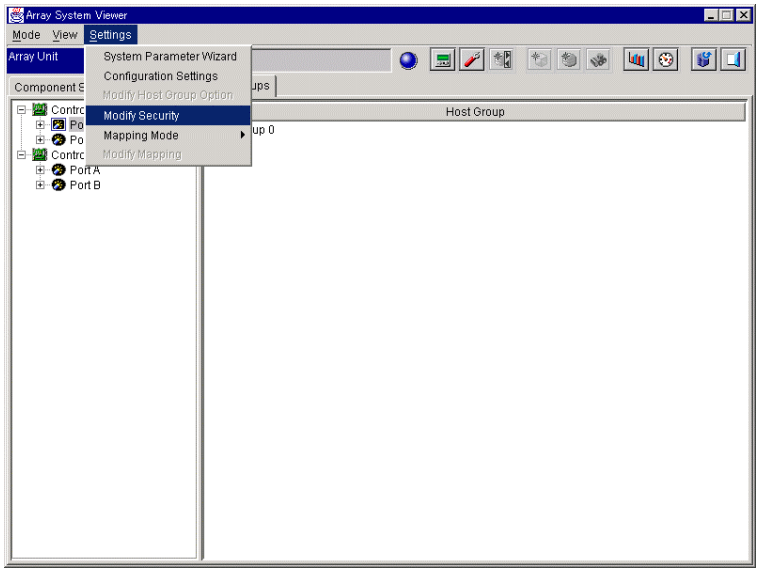


Figure 4.2 Array System Viewer Panel (Setting Security Information)

The Security Property panel appears (see Figure 4.3).

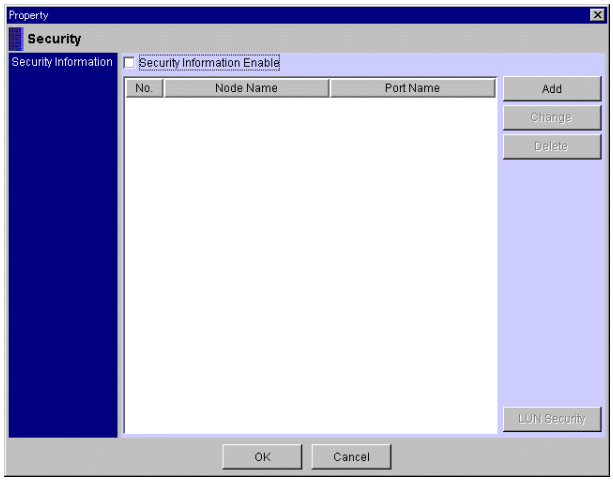


Figure 4.3 Security Property Panel

5. Click **Add** button. The WWN dialog appears (see Figure 4.4).

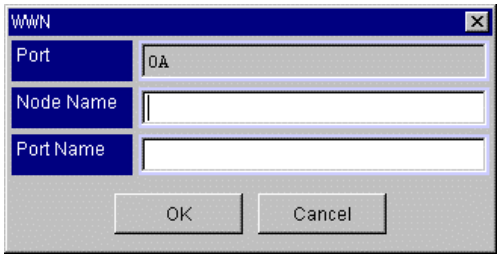


Figure 4.4 WWN Dialog Box

6. Enter the **Node Name** (16 hexadecimal digits) and **Port Name** (16 hexadecimal digits) of the host WWN. Click the **OK** button (see Figure 4.5).

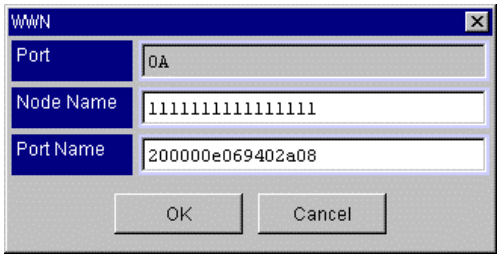


Figure 4.5 Node Name Entry

The added WWN appears in the Security property field (see Figure 4.3).

7. In the Security panel (refer to Figure 4.3), click the **Security Information Enable** check box and then the **SANtinel (LUN Security)** button. The SANtinel (LUN Security) panel appears (see Figure 4.6).

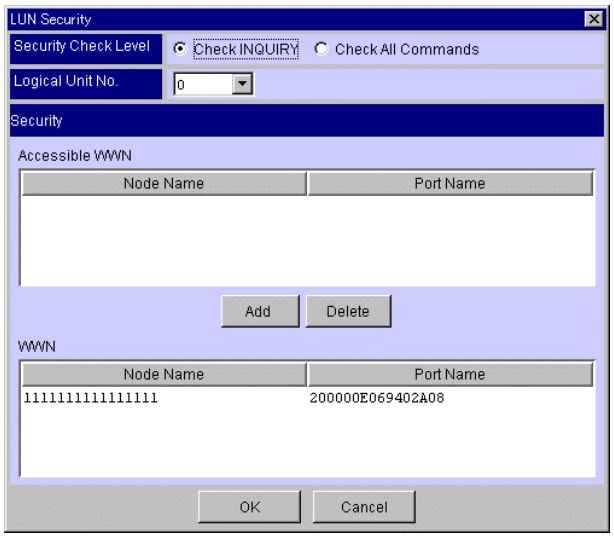


Figure 4.6 LUN Security Panel (Selecting Security Check Level, Logical Unit No., and Node Name)

8. Select **Security Check Level** and **Logical Unit No.** from the Logical Unit No. drop-down list. Select the **Node Name** from the Node Name list. Click the **Add** button.

9. Click the **OK** button.

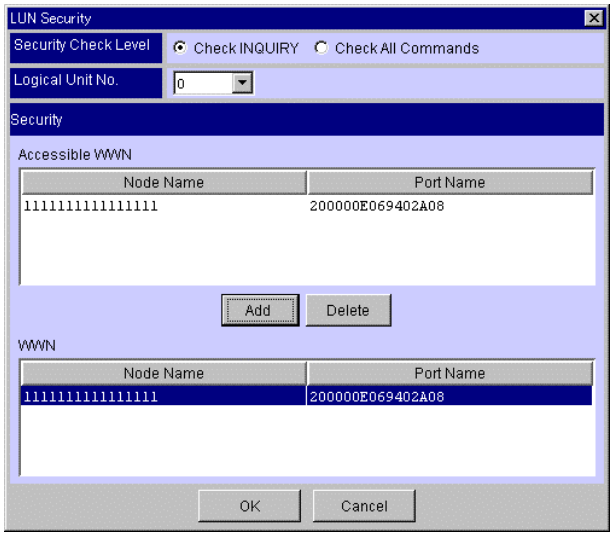


Figure 4.7 LUN Security Panel (Selecting Security Check Level and Logical Unit)

10. In the SANtinel (Security Property) panel, click the **OK** button. The following message appears (see Figure 4.8).

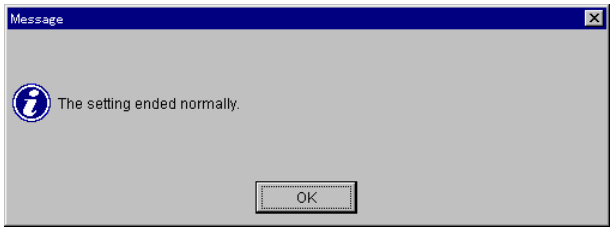


Figure 4.8 Setting Ended Confirmation Message

11. Click the **OK** button. This completes the security information setting procedure.
12. Write down the security information on the following form (see Figure 4.9) and update it when changes are made.

CTL#	Port#	Node name of the host	Port name of the host	LUN which allows the host to access

Figure 4.9 Security Information List

4.4 Deleting the WWN of the Host HBA

To delete the WWN information of the host HBA using Resource Manager 9500V:

1. Start Resource Manager 9500V and change to **Management Mode**. For details, refer to the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
2. Register the array unit in which you want to delete SANtinel 9500V and connect to this array unit. The Array System Viewer panel appears (refer to Figure 4.1).
3. Click the **Host Groups** tab, and select the Port from which you want to delete the WWN Information.
4. From the **Settings** menu of the Array System Viewer panel, select **Modify Security** (refer to Figure 4.10).
5. Click the security **No.** to delete the security information among those ports displayed in the **Security Information** box. Click the **Delete** button (see Figure 4.10).

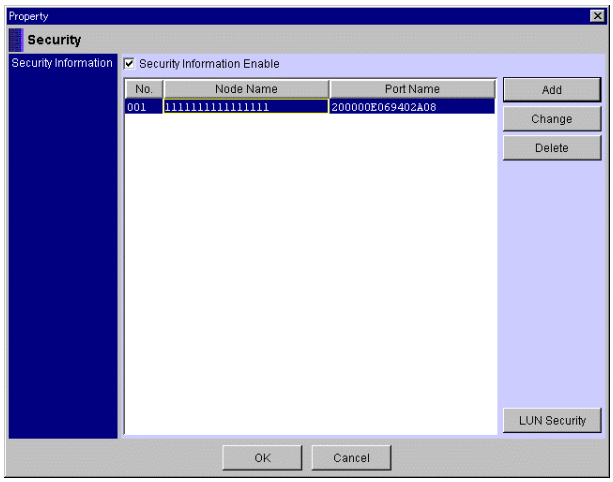


Figure 4.10 Security Property Panel (Delete the WWN of the Host HBA)

6. Click the **OK** button. A message appears (refer to Figure 4.8).
7. Click the **OK** button. This completes the security information deletion procedure.

4.5 Deleting the WWN Accessible for Each LUN

To delete the WWN information accessible for each LUN using Resource Manager 9500V:

1. Start Resource Manager 9500V and change to **Management Mode**. For details, refer to the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
2. Register the array unit in which you want to delete SANtinel 9500V and connect to this array unit. The Array System Viewer panel appears (refer to Figure 4.1).
3. Click the **Host Groups** tab, and select the Port from which you want to delete the WWN Information.
4. From the **Settings** menu of the Array System Viewer panel, select **Modify Security** (refer to Figure 4.2).
5. Click the security **No.** to delete the security information among those ports displayed in the **Security Information** box. Click the **SANtinel (LUN Security)** button.
6. Click **WWN** to delete from the **Accessible WWN** box. Click the **Delete** button.

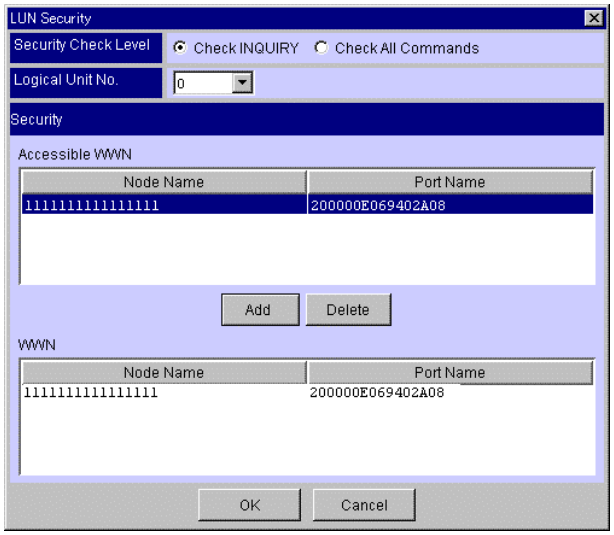


Figure 4.11 Selecting the WWN to Delete

7. Click the **OK** button on the SANtinel (LUN Security) panel.
8. Click the **OK** button on the Security Property panel.
   A message appears (refer to Figure 4.8).
9. Click the **OK** button. This completes the security information deletion procedure.

4.6 Changing the WWN of the Host HBA (Changing the WWN when the host HBA is replaced)

To change the WWN of the host HBA with Resource Manager 9500V:

Note: Perform this operation when the host HBA is replaced.

1. Start Resource Manager 9500V and change to **Management Mode**. For details, refer to the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605).
2. Register the array unit in which you want to change SANtinel 9500V and connect to this array unit. The Array System Viewer panel appears (refer to Figure 4.1).
3. Click the **Host Groups** tab, and select the Port for which you want to change the WWN Information.
4. From the **Settings** menu of the Array System Viewer panel, select **Modify Security** (refer to Figure 4.2).
5. Click the change the security information about the ports in the **Security Information** box. Click the **Change** button.
6. In the resulting WWN dialog box, enter the **Node Name** and the **Port Name** of the host's WWN (see Figure 4.12). Click the **OK** button. **Node Name** and **Port Name** are 16 hexadecimal digits.

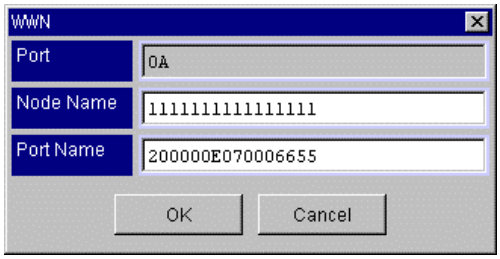


Figure 4.12 WWN Dialog Box

7. Click the **OK** button. A message appears (refer to Figure 4.8).
8. Click the **OK** button. This completes the security information change procedure.

Chapter 5 Troubleshooting

5.1 Troubleshooting

The 9500V subsystem provides continuous data availability and is not expected to fail in any way that would interrupt access to user data. For troubleshooting information on the 9500V subsystem or Resource Manager, please refer to the 9500V User and *Reference Manual* (MK-92DF601), the *Resource Manager 9500V User's Guide for GUI* (MK-92DF605), or the *Resource Manager 9500V User's Guide for CLI* (MK-92DF603).

5.2 Calling the Hitachi Data Systems Technical Support Center

If you need to call the Hitachi Data Systems Technical Support Center, be sure to provide as much information about the problem as possible. Include the circumstances surrounding the error or failure and the exact content of any error codes and/or messages displayed. The worldwide Hitachi Data Systems Technical Support Centers are:

- Hitachi Data Systems North America/Latin America
  San Diego, California, USA
  1-800-348-4357
- Hitachi Data Systems Europe
  Contact Hitachi Data Systems Local Support
- Hitachi Data Systems Asia Pacific
  North Ryde, Australia
  011-61-2-9325-3300

Appendix A SANtinel Operations Using CLI

This section includes the following:

- Installing SANtinel 9500V
- Uninstalling SANtinel 9500V
- Enabling or Disabling SANtinel 9500V
- Browsing and Setting SANtinel 9500V Information

A.1 Installing SANtinel 9500V

The SANtinel 9500V feature is usually unselectable (locked). To make this feature available, you must install SANtinel 9500V and make its functions selectable (unlocked). To install this function, use the key code provided with the optional feature.

SANtinel 9500V is installed and uninstalled through the Resource Manager 9500V.

Note: Before installing and uninstalling, make sure that the array unit is in normal operating mode. If a failure such as a controller blockade has occurred, installation and uninstallation operations cannot be performed.

To install SANtinel 9500V using the CLI version of Resource Manager 9500V:

1. From the command prompt, register the subsystem (array unit) in which you will install SANtinel 9500V and connect to the subsystem (for details, refer to *Resource Manager 9500V User's Guide for CLI* (MK-92DF603).
2. Unlock the optional features by using either of the following:

Example 1:

```
% auopt -unit df600 -lock off -keycode Key code
Password:
Option was opened.
%
```

Example 2:

```
% auopt -unit df600 -refer
Password:
Option name     Status
LUN-SECURITY    Enable
%
```

A.2 Uninstalling SANtinel 9500V

To uninstall SANtinel 9500V, use the key code provided with the optional feature.

SANtinel 9500V is installed and uninstalled through the Resource Manager 9500V.

To uninstall SANtinel 9500V using the CLI version of Resource Manager 9500V:

1. From the command prompt, register the subsystem (array unit) in which you will uninstall SANtinel 9500V and connect to the subsystem (for details, refer to *Resource Manager 9500V User's Guide for CLI* (MK-92DF603).
2. Lock the optional features by using the following:

Example 1:

```
% auopt -unit df600 -lock on -keycode Key code
Password:
Option was closed.
%
```

Example 2:

```
% auopt -unit df600 -refer
Password:
DMEC002015:No information displayed.
%
```

A.3 Enabling or Disabling SANtinel 9500V

To enable or disable SANtinel 9500V (without uninstalling this function) using the CLI version of Resource Manager 9500V:

1. From the command prompt, register the subsystem (array unit) in which you will change the status of the SANtinel feature and connect to the subsystem (for details, refer to *Resource Manager 9500V User's Guide for CLI* (MK-92DF603).
2. Execute the **auopt** command to change the status (enable or disable) of the SANtinel feature.

The following is an example of how to change the status from enable to disable. To change the status from disable to enable, enter enable after the –st option.

Example 1:

```
% auopt -unit df600 -option LUN-SECURITY -st disable
Password:
Option setting ended normally.
%
```

Example 2:

```
% auopt -unit df600 -refer
Password:
Option name     Status
LUN-SECURITY    Disable
%
```

Note 1: This setting is not active until the host is rebooted. The subsystem cannot access the host until the reboot is completed and the host restarts. Therefore, be certain the host has stopped accessing data before starting the reboot process.

Note 2: Even when the SANtinel 9500V feature is disabled, the access check settings are valid.

A.4 Browsing and Setting SANtinel 9500V Information

When SANtinel 9500V information has been set, only specified hosts are allowed to access the selected LUNs. SANtinel 9500V information consists of the following:

- Host Identification Information
- Access Check Required Information
- Setting the Security Information
- Deleting the WWN of the Host HBA
- Deleting the WWN Accessible for Each LUN
- Changing the WWN of the Host HBA (Changing the WWN when the host is replaced)

A.4.1 Host Identification Information

Host identification information specifies which hosts are allowed to access a selected LUN. This information contains four setting items per host for each. Up to 128 hosts can be designated.

- Host Node Name (mandatory)
- Host Port Name (mandatory)
- LUN which allows the host access (specified with internal LU; mandatory)

A.4.2 Access Check Necessity Information

The access check necessity information specifies whether a selected LUN inhibits access by a host other than the specified host. When the -lus setting is on, a selected LUN inhibits access by any host other than the specified host. When the -lus setting is off, all hosts can access a selected LUN; host identification information is ignored.

Table A.1 lists the status of each host identification item:

Table A.1 Host Identification Item Status

No.	Host identification item	Setting	Browsing	Access-check
1	Host's node name	Enabled	Enabled	Not checked
2	Host's port name	Enabled	Enabled	Checked
3	LUN which allows the host to access	Enabled	Enabled	Checked

Note: Host identification information and Access Check Necessity Information must be set for each port.

A.4.3 Setting the Security Information

Security information is set through the Resource Manager 9500V.

Note: Before setting the security information, you must install SANtinel 9500V and make its functions selectable (unlocked).

1. From the command prompt, register the subsystem (array unit) in which you want to set the security information and connect to the subsystem (for details, refer to *Resource Manager 9500V User's Guide for CLI* (MK-92DF603).
2. Execute the **auhgwwn** command to specify the subsystem.
3. Use the following settings:
   - Subsystem name: df600
   - Controller: 0
   - Port: A
   - Host information (node name and port name): 1111111111111111 and 200000e069402a08

Example:

```
% auhgwwn -unit df600 -set -lus 0 A on -perm 0 A 1111111111111111 20000e069402a08
Password:
This security information has bee set successfully.
%
```

4. Specify as shown below when the checking information has been set:

Example:

```
% auhgwwn -unit df600 -refer
Password:
Security Information
Port    LUN Security    Node name           Port name
  0A    on              1111111111111111    20000E069402A08
  0B    off
  1A    off
  1B    off
%
```

5. Write down the security information on the following form (see Figure A.1) and update it when changes are made.

CTL#	Port#	Node name of the host	Port name of the host	LUN which allows the host to access

Figure A.1 Security Information List

A.4.4 Deleting the WWN of the Host HBA

To delete the WWN information of the host HBA using Resource Manager 9500V:

1. From the command prompt, register the subsystem (array unit) in which you want to set the security information and connect to the subsystem (for details, refer to *Resource Manager 9500V User's Guide for CLI* (MK-92DF603).
2. Execute the **auhgwwn** command to specify the subsystem.
3. Set as shown, when the following information needs to be deleted:
   - Subsystem name: df600
   - Controller: 0
   - Port: A
   - Host information (node name and port name): 1111111111111111 and 200000e069402a08

Example:

```
% auhgwwn -unit df600 -rm -perm 0 A 1111111111111111 200000e069402a08
Password:
This security information has bee set successfully.
%
```

4. Specify as shown when setting the following information:

Example:

```
% auhgwwn -unit df600 -refer
Password:
Security Information
Port  LUN Security     Node name          Port name
  0A  off              [                                ]
  0B  off                                  Deleted information
  1A  off
  1B  off

%
```

A.4.5 Deleting the WWN Accessible for Each LUN

This procedure is identical to the procedure for deleting the WWN of the Host HBA in section A.4.4.

A.4.6 Changing the WWN of the Host HBA (Changing the WWN when the host HBA is replaced)

This procedure is identical to the procedure for Setting the Security Information in section A.4.3.

The following is an example in which SANtinel was validated and the host WWN was specified as **LU 0**.

Example:

```
Security Information
Port   LUN Security    Node name          Port name
  0A   on (INQUIRY)    1111111111111111   200000E069402A080
  0B   off
  1A   off
  1B   off
```

Appendix B Using the WWN Change Operation when the HBA is Replaced

When you replace the HBA of the host (server) using SANtinel 9500V, you need to change the WWN setting of SANtinel 9500V. This section includes the following information:

- WWN Change Procedure when the HBA is Replaced
- Obtaining the WWN of a Host

B.1 WWN Change Procedure when the HBA is Replaced

Follow these steps:

1. Check the WWN before and after HBA replacement. For the WWN after HBA replacement, see *Obtaining the WWN of a Host* in section B.2.
2. Change the WWN before HBA replacement to the WWN after HBA replacement by the following SANtinel 9500V setting procedure.

   When changing the setting, refer to Changing the WWN of the Host HBA (Changing the WWN when the host HBA is replaced) in section A.4.6.
3. Restart the host with the replaced HBA. Verify that the LU was recognized; this must occur before HBA replacement can be recognized after the HBA replacement. When the LU is not recognized, SANtinel 9500V is not correctly set. Use the procedures from step 2 above to set the WWN again.

B.2 Obtaining the WWN of a Host

The node name, port name, and N_port ID of a host (which is required as host identification information) can be obtained using the host console.

This section explains how to obtain the WWN of a host on the following systems:

- Solaris™
- HP®
- IBM®
- SGI™
- Windows NT®/Windows® 2000

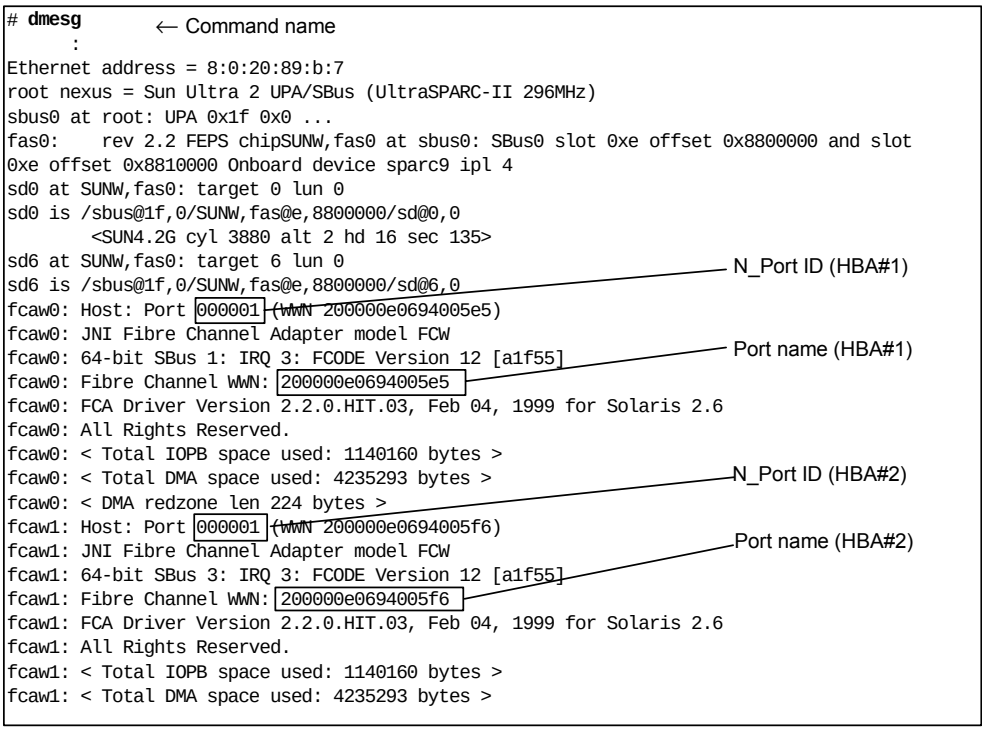
B.2.1 Solaris™

There are two methods for obtaining the WWN of a host:

Method 1:

To obtain the WWN of a host when the HBA is a JNI FC64-1063 or FCI-1063 (driver version: HIT.06.01 earlier):

1. Execute the following command to obtain the WWN of the HBA.



2. Read and record the port name and the N_Port ID. The node name can be obtained from the port name. Replace the value "20" of the highest one byte of the port name (200000e069xxxxxx) with "10".

Example:

Port name: 200000e0694005e5

↓

Node name: 100000e0694005e5

When the JNI HBA is FC64-1063 or FCI-1063 (driver version: HIT.06 later), or FCE-1063, FCE-6410, FCE-6460, FCE-1473, FCC-6460, the system parameters of the subsystem must be changed.

1. Execute the following command to obtain the file name of the HBA.

Example:

```
E250-1# luxadm inq /dev/rdsk/c3t0d0s2 ←Command name

INQUIRY:
  Physical Path:
  /devices/pci@1f,4000/fibre-channel@4/sd@0,0:c,raw
Vendor:               HITACHI
Product:              DF400
Revision:
Device type:           0x0 (Disk device)
Removable media:        no
ISO version:           0
ECMA version:          0
ANSI version:          2 (Device complies to ANSI X3.131-1994 (SCSI-2))
Response data format:    2
Additional length:      0x73
          VENDOR-SPECIFIC PARAMETERS
Byte#             Hex Value                                    ASCII
36   44 35 30 4c 30 30 42 41 30 30 30 30 00 31 41 00     D50L00BA0000.1A.
     00 01 00 00                                            ....
96   00 00 05 00 00 00 ff 00 10 00 00 00 0e 24 90 74     .....$.t
     10 00 08 00 20 b0 19 a8                              .... ...
                                  Node Name
```

2. Refer to the node name shown in the previous output example. The port name can be obtained from the node name. When the node name is 100000000e249074, the port name is obtained through replacement of the top byte, that is, 10 with 20. Therefore, the port name turns out to be 200000000e249074.

Example:

Node name: 100000000e249074

↓

Port name: 200000000e249074

Determining an HBA Location:

The WWN can be obtained from the label on the side of the JNI HBA.

B.2.2 HP®

To obtain the WWN of a host when the original HP® HBA is A3404A, A3740A, A5158A, A6684A, A6685A, or A6795A:

1. Execute the following command to obtain the file name of the HBA.

Example:

```
# ioscan -nfC fc
Class   I H/W Path Driver S/W State  H/W Type   Description
=============================================================
fc    0 0/4/0/0  fcT1 UNCLAIMED  UNKNOWN   PCI SerialBus (107e0004)
fc    1 0/5/0/0  fcT1 UNCLAIMED  UNKNOWN   PCI SerialBus (107e0004)
fc    2 0/8/0/0  td  CLAIMED   INTERFACE  HP Tachyon TL/TS Fibre Channel Mass S
torage Adapter
                 /dev/td2        <-- Device file Name
fc    3 0/12/0/0 td  CLAIMED   INTERFACE  HP Tachyon TL/TS Fibre Channel Mass S
torage Adapter
                 /dev/td3        <-- Device file Name
fc    4 1/10/0/0  fcT1 UNCLAIMED  UNKNOWN   PCI SerialBus (107e0004)
fc    5 1/12/0/0  fcT1 UNCLAIMED  UNKNOWN   PCI SerialBus (107e0004)
```

2. Refer to the Device file name shown in the output example above. In this example, the device file names are: /dev/td2 and /dev/td3.
3. Using the device file names shown above, execute the command shown below to obtain the WWN of the HBA.

Example:

```
# fcmsutil /dev/td3
              Vendor ID is = 0x00103c
              Device ID is = 0x001028
         TL Chip Revision No is = 2.3
      PCI Sub-system Vendor ID is = 0x00103c
          PCI Sub-system ID is = 0x000006
            Previous Topology = PTTOPT_FABRIC
           Local N_Port_id is = 0x011600
      N_Port Node World Wide Name = 0x50060b000008829f   <-- Node Name
      N_Port Port World Wide Name = 0x50060b000008829e   <-- Port Name
              Driver state = AWAITING_LINK_UP
           Hardware Path is = 0/12/0/0
        Number of Assisted IOs = 504123690
    Number of Active Login Sessions = 0
```

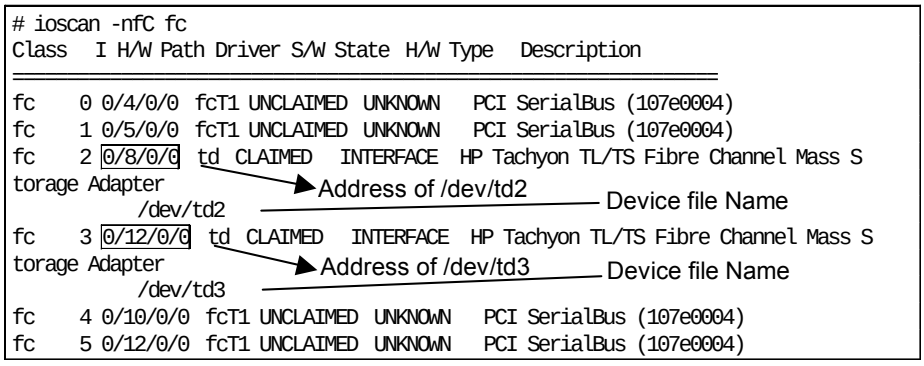
4. Refer to the node name and port name shown in the example above.

Determining an HBA Location:

When HP-UX® is running in HP9000, you may not be able to match the HBA with the WWN because there is no way to identify the HBA address based on the slot location. In this case, correlate the HBA with a WWN using the following procedure:

1. Connect the host and the subsystem. Start the system.
2. Execute the following command to obtain the device file name of the HBA.

Example:



3. Disconnect the fibre channel cable of the HBA of the WWN that you wish to identify.
4. Determine which disk is currently connected and its correspondence with the device file of the HBA.

Example:

```
# ioscan -nfC disk
Class    I  H/W Path     Driver  S/W State  H/W Type    Description
===================================================================
disk     0  0/0/1/0.2.0   sdisk   CLAIMED    DEVICE     HP     DVD-ROM 6x/32x
                    /dev/dsk/c0t2d0  /dev/rdsk/c0t2d0
disk     1  0/0/2/0.6.0   sdisk   CLAIMED    DEVICE     SEAGATE ST39102LC
                    /dev/dsk/c1t6d0  /dev/rdsk/c1t6d0
disk     2  0/0/2/1.6.0   sdisk   CLAIMED    DEVICE     SEAGATE ST39103LC
                    /dev/dsk/c2t6d0  /dev/rdsk/c2t6d0
disk   169  0/8/0/0.1.19.232.0.0.0  sdisk   CLAIMED    DEVICE     HITACHI DF500F
                    /dev/dsk/c19t0d0  /dev/rdsk/c19t0d0
disk   170  0/8/0/0.1.19.232.0.0.1  sdisk   CLAIMED    DEVICE     HITACHI DF500F
                    /dev/dsk/c19t0d1  /dev/rdsk/c19t0d1
         :                    HBA address                    not connected
disk   141  0/12/0/0.1.19.228.0.0.0 sdisk   NO_HW      DEVICE     HITACHI DF500F
                    /dev/dsk/c21t0d0  /dev/rdsk/c21t0d0
disk   297  0/12/0/0.1.19.228.0.0.1 sdisk   NO_HW      DEVICE     HITACHI DF500F
                    /dev/dsk/c21t0d1  /dev/rdsk/c21t0d1
         :
```

As indicated in the above example, the disks identified as NO-HW are not connected. According to this information and the address of the device file of the HBA, the device file name of the HBA, whose cable has been disconnected, is: /dev/td3.

Execute the **fcmsutil** to obtain the WWN of the /dev/td3.

5. Plug in the disconnected fibre channel.

B.2.3 IBM®

To obtain the WWN of a host when the original IBM is FC6227 or FC6228:

1. Execute the following command to obtain the device file name of the HBA.

Example:

```
# lsparent -C -k iocb
    fcs0 Available 27-08 FC Adapter <---Device file name
    fcs1 Available 3A-08 FC Adapter
    fcs2 Available 31-08 FC Adapter
    fcs3 Available 34-08 FC Adapter
```

2. Refer to the Device file name shown in the example above. In this example, the device file names are: fcs0, fcs1, fcs2, and fcs3.
3. Using the device file names given in the previous example, execute the following example to obtain the WWN of the HBA.

Example:

```
# lscfg -vl fcs0
DEVICE            LOCATION          DESCRIPTION

fcs0              27-08             FC Adapter

      Part Number.................09P1162
      EC Level....................D
      Serial Number...............KT04904230
      Manufacturer................0010
      FRU Number..................09P1173
      Network Address.............10000000C925437E <-- Port name
      ROS Level and ID............02903290
      Device Specific.(Z0)........4002206D
      Device Specific.(Z1)........10020193
      Device Specific.(Z2)........3001506D
      Device Specific.(Z3)........02000909
      Device Specific.(Z4)........FF101450
      Device Specific.(Z5)........02903290
      Device Specific.(Z6)........06113290
      Device Specific.(Z7)........07113290
      Device Specific.(Z8)........20000000C925437E
      Device Specific.(Z9)........SS3.22A0
      Device Specific.(ZA)........S1F3.22A0
      Device Specific.(ZB)........S2F3.22A0
      Device Specific.(YL)........P1-I8/Q1
```

The value shown in the Network Address section in the output example above is the port name.

Determining an HBA Location:

A label with the WWN is adhered on the genuine IBM HBA; identify the WWN.

B.2.4 SGI™

To obtain the WWN of a host when the genuine SGI™ is XT-FV-1PORT:

1. Execute the following command to obtain the WWN of the HBA.

Example:

```
origin2002 1# scsiha -w 2
2 Portname: 210000e08b01cb83   <-------- Port Name of the Slot 2

origin2002 2# scsiha -w 8
8 Portname: 210000e08b01fe64   <-------- Port Name of the Slot 8

origin2002 3# scsiha -w 11
11 Portname: 210000e08b01f454  <-------- Port Name of the Slot 11
```

2. Refer to the port name shown in the output example above.

Determining an HBA Location:

The location and arrangement of slots vary, depending on the model of SGI™ server. However, you match the HBA and WWN by referring to the slot location of each model.

B.2.5 Windows NT®/ Windows® 2000

There are two methods for obtaining the WWN of a host:

- Emulex Light Pulse
- Qlogic QLA2200F/QLA2300F

B.2.5.1 Emulex Light Pulse

When the Emulex driver is installed on the host, the **lputilnt** utility is installed on Windows NT®. Run the **lputilnt** utility to obtain the WWN of the host. Follow these steps:

1. Start the **lputilnt** utility.
2. Select **Adapter X** on the display. (Adapters corresponding to the number of installed HBAs are displayed.)
3. Select **Adapter Revision Levels** on the Category menu.
4. IEEE Address XX-XX-XX-XX-XX-XX (6 bytes) appears on the bottom of the screen.
5. Place **10-00** before the IEEE Address XX-XX-XX-XX-XX-XX. This is a port name.

Example:

`10-00-XX-XX-XX-XX-XX-XX`

6. The node name is equal to the port name.
7. The N_Port ID is omitted.
8. When two or more HBAs are installed, repeat Steps 2 through 7 above.

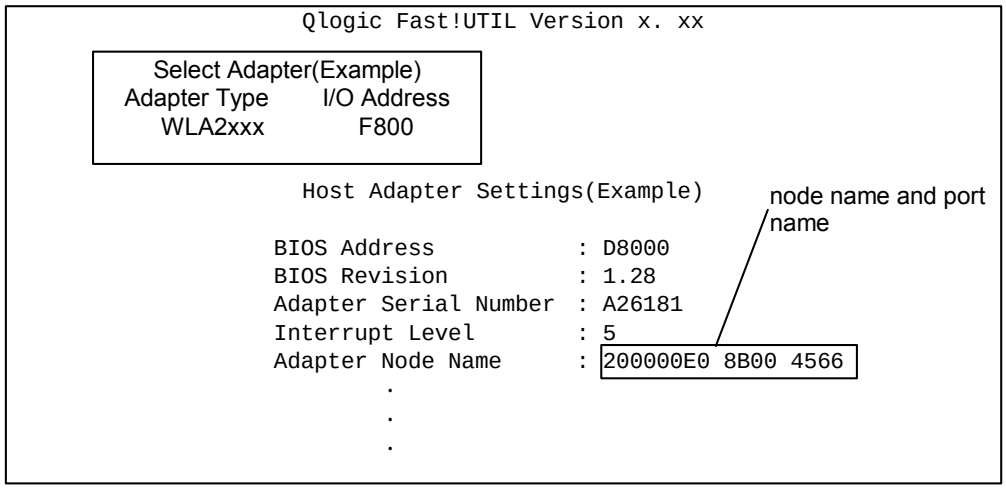
Note: The **lputilnt** utility is supported by the Emulex driver of version 4.2 or later. If the version is earlier than 4.2, check the IEEE Address by the label on the board.

B.2.5.2 Qlogic QLA2200F/QLA2300F

To obtain the WWN of a host on the Windows NT® (Qlogic2200F), follow these steps:

1. When the host starts up or when the QLA2xxx board is initialized for rebooting, the message: Press<ALT-Q> for Fast!UTIL appears. Press the **Q** key while holding down the **ALT key**. The Qlogic Fast!UTIL utility starts.
2. Select an adapter corresponding to the HBA. (Adapters corresponding to the number of installed HBAs are displayed.)
3. Select Configuration Settings from the **Fast!UTIL** option and press the **Enter** key.
4. Select Host Adapter Settings from **Configuration Setting** and press the **Enter** key.
5. Read the value in the Adapter Node Name field on the Host Adapter Settings window. This contains the node name and the port name of the host (set for security).
6. When two or more HBAs are installed, repeat Steps 2 through 5 above.

Example:



Acronyms and Abbreviations

DAMP	disk array manager program (now called Resource Manager)
FDD	floppy disk drive
HBA	host bus adapter
LU	logical unit
LUN	logical unit number
OS	operating system
Resource Manager	formerly referred to as disk array manager program
SAN	storage-area network
WWN	world wide name

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